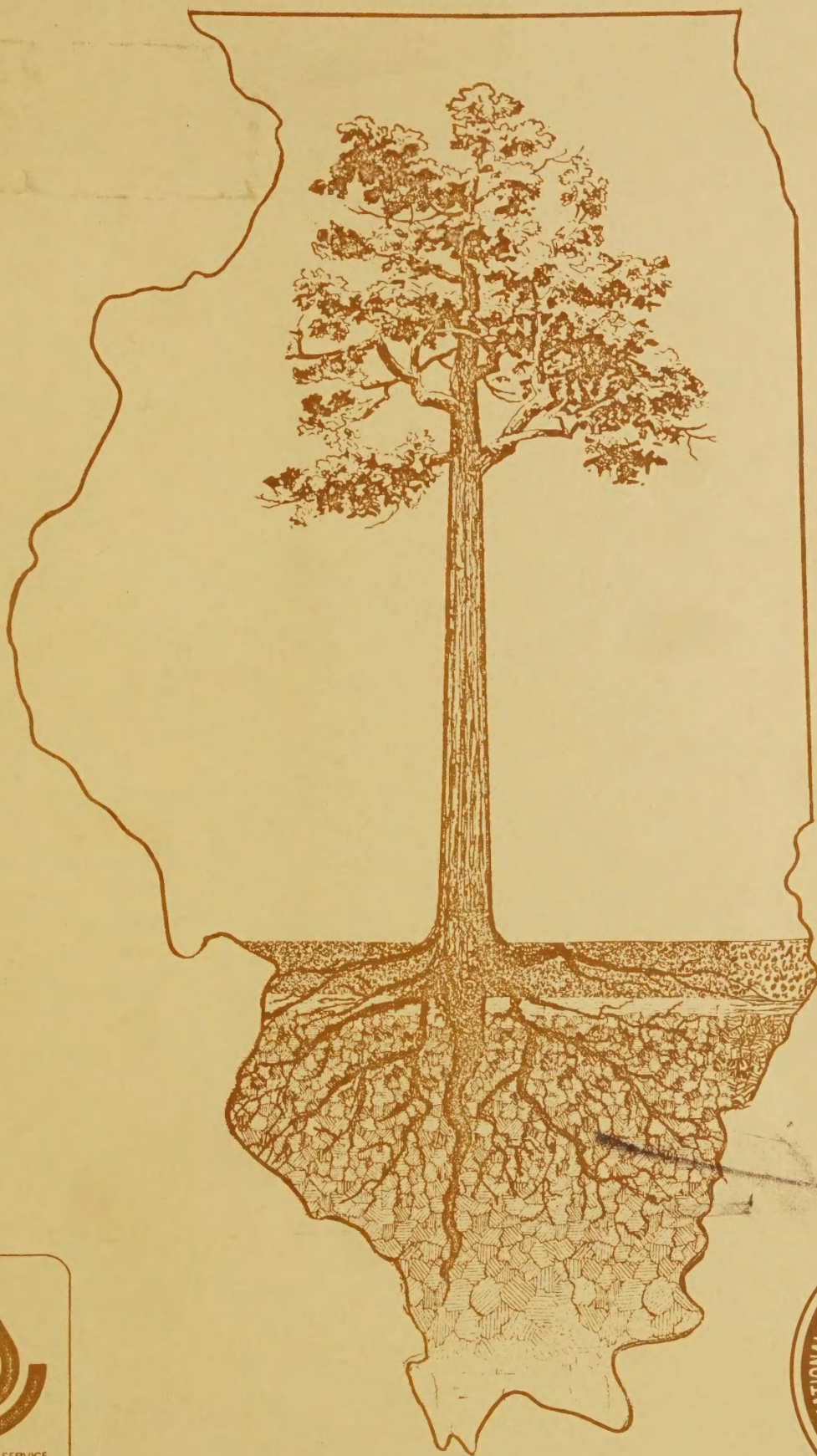


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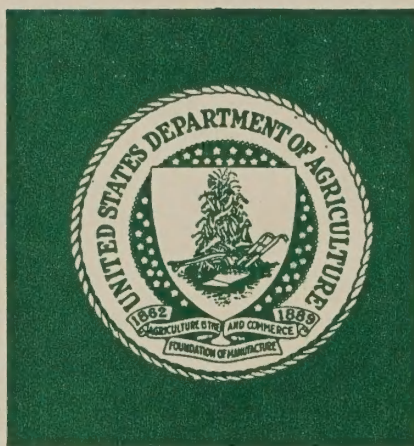
GUIDE TO THE SELECTION OF SOIL SUITABLE
FOR GROWING BLACK WALNUT IN ILLINOIS



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GUIDE TO THE SELECTION OF SOIL SUITABLE
FOR GROWING BLACK WALNUT IN ILLINOIS^{1/}

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1/ Contribution of North Central Forest Experiment Station, Forest Service, USDA, and Soil Conservation Service, USDA.

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The information in this guide is based on some black walnut research data, theoretical soil-plant relations considerations, and field experience of the authors and the other soil and plant scientists who reviewed the manuscript. In order to improve this guide, the authors welcome new information about the suitability of specific soils for this valuable hardwood.

Black walnut is in great demand by the public. It is used in the manufacture of furniture, paneling, decorative building trim, numerous specialty items, and is valued for its nut crop. As a result of this popularity and demand, the supply of black walnut is rapidly declining.

To meet the demand there is an increasing interest on the part of landowners in tending established stands and planting new ones. Planting and cultural care (weed control, pruning, thinning) of walnut are expensive; therefore, the landowner should be reasonably assured that the seedlings he plants will survive and grow as rapidly as possible. By selecting the proper soil and site, he increases this probability and reduces the length of time between establishment and the harvest of nuts and high quality black walnut timber.

The selection of the proper planting location involves many considerations, among them are drainage, soil depth, texture, and slope.

By referring to a soil survey published since 1964^{3/} or

^{3/} Published soil surveys are available at local offices of the Illinois Cooperative Extension Service and the U. S. Soil Conservation Service.

contacting the local Soil Conservation Service office, current information can be obtained for soils on any tract of land. The different soils, with specific physical and chemical characteristics which affect plant growth, are shown on a soil map in the soil survey report. Each soil is given a name and number and is described in detail. For example, the report says that the Sharon soil on narrow floodplains in southern Illinois is flooded occasionally, but it drains fairly rapidly. The natural fertility is moderately high and the soil holds a considerable amount of moisture that is available to plants. In general, Sharon is a good crop soil. But in southern Illinois, the size of fields with Sharon soils is typically small, hindering the use of large farm equipment. Therefore, some of the Sharon soil areas could be profitably planted to walnut. In contrast, an adjacent area on the floodplain with the poorly drained Bonnie soil would not be suited to grow walnut. A soil map distinguishes between the kinds of soils according to their location on the land.

The areas shown on a soil map are called "mapping units". They are named for the soil that dominates the area since a mapping unit rarely consists of only one soil. For example, a mapping unit of Sharon silt loam may include small areas of Bonnie silt loam and Belknap silt loam. These inclusions generally are smaller than two acres in size.

On some soil maps, two or more soil names are in the name of a mapping unit; these mapping units are called an "undifferentiated group". The soils could have been shown individually but for the purpose of the survey there was little value in separating them. The pattern and proportion of the soils are not uniform in all the areas shown. An area may be made up mainly of one of the soils or may consist of an equal amount of two or more soils. The names are joined with the word "and". "Hickory and Hennepin loams, 18 to 30 percent slopes", is an example. Undifferentiated group mapping units require on-site inspection to determine the distribution of the soils listed in the mapping unit name.

In some parts of a survey area different kinds of soils occupy small areas in such an intricate pattern that it is not practical to show them separately on the map. This kind of pattern is shown as one mapping unit and is called a "soil complex". The soil names are joined with a hyphen. "Sylvan-Bold silt loams, 18 to 30 percent slopes," is an example. These mapping unit areas also require on-site inspection.

To assist foresters and others who are concerned with growing black walnut trees, the soils of Illinois have been placed into 3 categories according to their suitability for the production of walnut trees. The categories are (1) SUITED, (2) QUESTIONABLE, and (3) UNSUITED described by criteria in table 1. Because some soils vary in important characteristics from place to place, they are placed in the QUESTIONABLE category and require on-site examination and evaluation. Where possible, this on-site evaluation should be made by a soil scientist-forester team to determine the condition at the specific site and judge the degree of soil limitation for black walnut growth. The other two categories do not require such an intensive on-site examination.

The reader must first refer to a soil survey map to locate and obtain the map symbol for the area of interest before he can use table 2. The map symbol is composed of 3 parts. The first group of numbers in the map symbol is the soil number; it identified the soil series name. The second part of the map symbol is a slope-class letter that gives the range of slopes in the mapping unit area. The third part of the map symbol is a number that indicates the erosion condition of the soil.

The soil numbers are listed in the first column of table 2. Soil series names are listed in the second column along with the textural class of the surface layer (or horizon). The slope-class letter is also given in the second column except when the soil occurs only on slopes less than 12 percent. For the sake of brevity the erosion condition of the soil is not shown in table 2.^{4/}

^{4/} Soils with class 2 erosion (slight to moderate past erosion) are considered suitable for walnut if other soil characteristics are favorable. Soils with class 3 (severe past erosion) will require on-site inspection.

The particular soil is classified by an "X" under the appropriate suitability category. When appropriate, the primary limiting characteristics of the soil, such as slope, internal drainage and texture, are indicated for those soils classified as Unsuited or Questionable Suitability.

Table 3 is an alphabetical listing of the soil names, each with its soil number.

After determining the suitability of the proposed area for black walnut, the landowner should be encouraged to consult further with an Illinois Division of Forestry District Forester about site preparation, planting stock, spacing of trees, weed control, and many other practices to obtain the best growth possible.

Table 1.--Criteria for determining suitability of Illinois soils for
growing black walnut

Soil characteristics	Suitability
	Questionable suitability
	Unsuited
Natural Soil <u>1/</u> Drainage Classes	Well drained, moderately well drained
	Somewhat poorly drained, somewhat excessively drained
	Excessively drained, poorly drained, very poorly drained
Effective Soil Depth <u>2/</u>	More than 40 inches
	20 to 40 inches
	Less than 20 inches
Dominant Texture ^{3/}	loam, silt; silt loam, silty clay loam, clay loam, sandy clay loam; fine sandy loam
	silty clay, sandy loam
	clay, sand, loamy sand, loamy fine sand
pH of Subsoil	4.5 to 8.4
	Less than 4.5
	Greater than 8.
Slope ^{4/}	A, B, C, and D (0 to 12%)
	E and F (12 to 30%) ^{5/}
	G (Greater than 30%) ^{6/}
Coarse Fragments (% by volume, greater than 2mm.)	Less than 25%
	25 to 60%
	Greater than 60%

^{1/} Defined on pages 170-172 of the Soil Survey Manual, Agricultural Handbook No. 18 and in the glossary of most recently published soil surveys.

^{2/} Refers to the thickness of soil material that plant roots can penetrate readily to obtain water and plant nutrients. Root penetration is inhibited by such features as bedrock, claypans, fragipans, etc., and zones saturated with water.

^{3/} Refers to the texture of the soil in the rooting zone, as defined on pages 207-213 of the above-mentioned Soil Survey Manual and in recently published soil surveys.

^{4/} Slope classes used in Illinois are as follows:

A = 0 to 2%

C = 4 to 7%

E = 12 to 18%

G = slopes
greater
than 30%

B = 2 to 4%

D = 7 to 12%

F = 18 to 30%

- 5/ Where slope is the only limiting feature, soils that are in coves and on north and east facing lower slopes can be rated as suited. Soils on narrow ridges and on south and west facing upper slopes are generally unsuited.
- 6/ Small areas that have slope gradients of less than 30 percent may be included in the G slope class unit.

TABLE 2. SUITABILITY OF SOILS IN ILLINOIS FOR BLACK WALNUT^{1/}

Soil Number	Soil Series and Slope Phases ^{1/}	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
2	Cisne silt loam			X poorly drained
3	Hoyleton silt loam		X somewhat poorly drained	
4	Richview silt loam	X		
5	Blair silt loam		X somewhat poorly drained	
6	Fishhook silt loam		X somewhat poorly drained	
7	Atlas silt loam			X clay subsoil
8	Hickory loam			
	8C, 8D- - - - -	X		
	8E, 8F- - - - -		X slope/aspect	
	8G - - - - -			-X slope
12	Wynoose silt loam			X poorly drained
13	Bluford silt loam		X somewhat poorly drained	
14	Ava silt loam		X fragipan at 30"	
15	Parke silt loam			
	15B, 15C, 15D- - - -X			
	15E, 15F - - - - -		-X slope/aspect	
16	Rushville silt loam			X poorly drained
17	Keomah silt loam		X somewhat poorly drained	
18	Clinton silt loam			
	18 A, 18B, 18C, 18D-X			
	18E - - - - -		X slope/aspect	

^{1/} Active correlated soil series as of October 1971.

<u>Soil Number</u>	<u>Soil Series and Slope Phases ^{1/}</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
19	Sylvan silt loam 19D-----X 19E, 19F-----		X slope/ aspect	
21	Pecatonica silt loam 21B, 21C, 21D-----X 21E -----		X slope/ aspect	
22	Westville silt loam 22C, 22D-----X 22E, 22F-----		X slope/ aspect	
23	Blount silt loam		X somewhat poorly drained	
24	Dodge silt loam 24B, 24C, 24D-----X 24E -----		X slope/ aspect	
25	Hennepin loam 25E, 25F ----- 25G-----		X slope/ aspect	X slope
26	Wagner silt loam			X poorly drained
27	Miami silt loam 27B, 27C, 27D-----X 27E, 27F -----		X slope/ aspect	
28	Jules silt loam	X		
29	Dubuque silt loam 29C, 29D ----- 29E, 29F-----		X limestone at 20-40" X slope/ aspect & depth	
30	Hamburg silt 30F, 30G			X slope
31	Leavan loamy fine sand			X loamy fine sand

<u>Soil Number</u>	<u>Soil Series and Slope Phases</u> ^{1/}	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
34	Tallula silt loam 34C, 34D -----X 34E, 34F -----		X slope/ aspect	
35	Bold silt loam 35D ----- X 35E, 35F -----		X slope/ aspect	
36	Tama silt loam 36A, 36B, 36C, 36D - X 36E -----		X slope/ aspect	
37	Worthen silt loam	X		
39	Oakford silt loam	X		
40	Dodgeville silt loam		limestone at X 20-40"	
41	Muscatine silt loam		X somewhat poorly drained	
42	Papine au fine sandy loam		X sand over clay	
43	Ipava silt loam		X somewhat poorly drained	
45	Denny silt loam			X poorly drained
46	Herrick silt loam		X somewhat poorly drained	
48	Ebbert silt loam			X poorly drained
49	Watseka loamy fine sand			X sand subsoil
50	Virden silty clay loam			X poorly drained
53	Bloomfield fine sand		X sandy loam & sand sub- soil	
54	Plainfield sand			X sand
55	Sidell silt loam	X		
56	Dana silt loam	X		

<u>Soil Number</u>	<u>Soil Series and Slope Phases 1/</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
57	Montmorenci silt loam	X		
59	Lisbon silt loam		X somewhat poorly drained	
60	LaRose silt loam	X		
61	Atterberry silt loam		X somewhat poorly drained	
62	Herbert silt loam		X somewhat poorly drained	
67	Harpster silty clay loam			X poorly drained
68	Sable silty clay loam			X poorly drained
69	Milford silty clay loam			X poorly drained
70	Beaucoup silty clay loam			X poorly drained
71	Darwin silty clay			X poorly drained
72	Sharon silt loam	X		
73	Ross loam	X		
74	Radford silt loam		X somewhat poorly drained	
75	Drury silt loam	X		
76	Otter silt loam			X poorly drained
77	Huntsville silt loam	X		
78	Arenzville silt loam		X somewhat poorly drained	
79	Volinia silt loam		X sand or gravel at 20-40"	
81	Littleton silt loam		X somewhat poorly drained	
82	Millington loam			X poorly drained
83	Wabash silty clay			X very poorly drained

<u>Soil Number</u>	<u>Soil Series and Slope Phases 1/</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
84	Okaw silt loam			X poorly to very poorly drained
85	Jacob clay			X poorly drained
87	Dickinson sandy loam		X sandy loam subsoil	
88	Sparta loamy sand			X sand subsoil
89	Maumee fine sandy loam			X very poorly drained
91	Swygert silty clay loam			X clay & silty clay subsoil
92	Sarpy sand			X sand
93	Rodman gravelly loam			X sand & gravel at less than 15"
97	Houghton peat			X very poorly drained
98	Ade loamy fine sand		X sand sub- soil	
100	Palms muck			X very poorly drained
102	La Hogue loam		X somewhat poorly drained	
103	Houghton muck			X very poorly drained
104	Virgil silt loam		X somewhat poorly drained	
105	Batavia silt loam	X		
107	Sawmill silty clay loam			X poorly drained
108	Bonnie silt loam			X poorly drained
109	Racoon silt loam			X poorly drained
112	Cowden silt loam			X poorly drained
113	Ocone silt loam		X somewhat poorly drained	
114	O'Fallon silt loam		X fragipan at 30"	

<u>Soil Number</u>	<u>Soil Series and Slope Phases 1/</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
116	Whitson silt loam			X poorly drained
119	Elco silt loam 119C, 119D ----- X 119E -----		X slope/aspect	
120	Huey silt loam			X poorly drained-high sodium
122	Colp silt loam		X silty clay subsoil	
125	Selma loam			X poorly drained
127	Harrison silt loam	X		
128	Douglas silt loam	X		
130	Pittwood fine sandy loam			X poorly drained
131	Alvin fine sandy loam 131A, 131B, 131C, 131D ----- X 131E, 131F -----		X slope/aspect	
132	Starks silt loam		X somewhat poorly drained	
134	Camden silt loam 134A, 134B, 134C, 134D ----- X 134E, 134F-----		X slope/aspect	
136	Brooklyn silt loam			X poorly drained
137	Ellison silt loam		X sand & gravel at 24-40"	
138	Shiloh silty clay loam			X very poorly drained
141	Wesley sandy loam		X somewhat poorly drained	
142	Patton silty clay loam			X poorly drained
145	Saybrook silt loam	X		

<u>Soil Number</u>	<u>Soil Series and Slope Phases 1/</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
146	Elliott silt loam		X somewhat poorly drained	
147	Clarence silty clay loam			X clay subsoil
148	Proctor silt loam	X		
149	Brenton silt loam		X somewhat poorly drained	
150	Onarga sandy loam	X		
151	Ridgeville fine sandy loam		X somewhat poorly drained	
152	Drummer silty clay loam			X poorly drained
153	Pella silty clay loam			X poorly drained
154	Flanagan silt loam		X somewhat poorly drained	
155	Stockland loam			X sand and gravel at less than 20"
157	Rankin sandy loam		X sandy loam subsoil	
159	Pillot silt loam		X sand at 20-40"	
161	Newart silt loam		X somewhat poorly drained	
162	Gorham silty clay loam			X poorly to somewhat poorly drained
164	Stoy silt loam		X somewhat poorly drained-fragipan at 25-45"	
165	Weir silt loam			X poorly drained
167	Lukin silt loam		X somewhat poorly drained	
171	Catlin silt loam	X		

<u>Soil Number</u>	<u>Soil Series and Slope Phases 1/</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
172	Hoopeston sandy loam		X somewhat poorly drained-sandy loam	
173	McGary silt loam		X somewhat poorly drained-silty clay subsoil	
175	Lamont fine sandy loam	X		
176	Marissa silt loam			X somewhat poorly drained to poorly drained
178	Ruark fine sandy loam			X poorly drained
180	Dupo silt loam		X somewhat poorly drained	
184	Roby fine sandy loam		X somewhat poorly drained	
187	Milroy sandy loam			X poorly drained
188	Beardstown loam		X somewhat poorly drained	
189	Martinton silt loam		X somewhat poorly drained	
190	Onarga fine sandy loam	X		
191	Knight silt loam			X poorly drained
192	Del Rey silt loam		X somewhat poorly drained	
194	Morley silt loam 194B, 194C, 194D ----- X 194E, 194F -----		X slope/aspect	
197	Troxel silt loam	X		
198	Elburn silt loam		X somewhat poorly drained	

<u>Soil Number</u>	<u>Soil Series and Slope Phases 1/</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
199	Plano silt loam	X		
200	Orio sandy loam			X poorly drained
201	Gilford fine sandy loam			X very poorly drained
202	Biggs sandy loam			X loamy sand subsoil
203	Kilbourne loamy sand			X sand
204	Ayr sandy loam		X sandy loam subsoil	
205	Metea loamy sand		X loamy sand 20-40" thick underlain with clay loam	
206	Thorp silt loam			X poorly drained
208	Sexton silt loam			X poorly drained
210	Lena muck			X very poorly drained
211	Tamms silt loam		X somewhat poorly drained	
212	Thebes silt loam		X sand at 20-40"	
214	Hosmer silt loam		X fragipans at 30"	
215	Wartrace silt loam 215B, 215C, 215D ----- X 215E, 215F -----		X slope/ aspect	
216	Stookey silt loam 216E, 216F ----- 216G -----		X slope/ aspect	X slope
218	Newberry silt loam			X poorly drained

<u>Soil Number</u>	<u>Soil Series and Slope Phases 1/</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
219	Millbrook silt loam		X somewhat poorly drained	
221	Parr silt loam	X		
223	Varna silt loam	X		
224	Strawn silt loam 224C, 224D ----- X 224E 224F -----		X slope/ aspect	
227	Argyle silt loam 227B, 227C, 227D -- X 227E -----		X slope/ aspect	
228	Nappanee silt loam			X clay subsoil
229	Monee silt loam			X poorly to very poorly drained
230	Rowe silty clay			X poorly to very poorly drained
232	Ashkum silty clay loam			X poorly drained
233	Birkbeck silt loam 233B, 233C, 233D -- X 233E, 233F -----		X slope/ aspect	
234	Sunbury silt loam		X somewhat poorly drained	
235	Bryce silty clay			X poorly drained
236	Sabina silt loam		X somewhat poorly drained	
238	Rantoul silty clay			X very poorly drained
239	Dorchester silt loam		X check drainage	
240	Plattville silt loam	X		
241	Chatsworth silt loam			X clay sub-soil
242	Kendall silt loam		X somewhat poorly drained	

<u>Soil Number</u>	<u>Soil Series and Slope Phases 1/</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
243	St. Charles silt loam 243A, 243B, 243C, 243D ----- X 243E ----- X slope/ aspect			
244	Hartsburg silty clay loam			X poorly drained
246	Bolivia silt loam	X		
248	McFain silty clay			X poorly to very poorly drained
249	Edinburg silty clay loam			X poorly drained
250	Velma loam 250C, 250D ----- X 250E ----- X slope/ aspect			
252	Harvel silty clay loam			X very poorly drained
253	Stonington loam			X sand & gravel at less than 20"
256	Pana silt loam 256B, 256C, 256D --- X 256E ----- X slope/ aspect			
257	Clarksdale silt loam		X somewhat poorly drained	
258	Sicily silt loam	X		
259	Assumption silt loam 259C, 259D ----- X 259E ----- X slope/ aspect			
261	Niota silt loam			X poorly drained
262	Denrock silt loam		X somewhat poorly drained	
263	Fall silt loam		X check drainage	
265	Lomax loam		X check depth to sand	

<u>Soil Number</u>	<u>Soil Series and Slope Phases</u> <u>1/</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
266	Disco sandy loam		X sandy loam subsoil	
268	Mt. Carroll silt loam 268A, 268B, 268C, 268D ----- X 268E -----		X slope/ aspect	
271	Timula silt loam 271D ----- X 271E, 271F -----		X slope/ aspect	
272	Edgington silt loam			X poorly drained
273	Decorra silt loam	X		
274	Seaton silt loam 274B, 274C, 274D ---- X 274E, 274F -----		X slope/ aspect	
275	Joy silt loam		X somewhat poorly drained	
276	Biggsville silt loam	X		
277	Port Byron silt loam	X		
278	Stronghurst silt loam		X somewhat poorly drained	
279	Rozetta silt loam	X		
280	Fayette silt loam 280B, 280C, 280D -- X 280E, 280F -----		X slope/ aspect	
281	Hopper silt loam		X slope/ aspect	
282	Chute fine sand			X sand
283	Clary silt loam	X		
284	Tice silty clay loam		X somewhat poorly drained	

<u>Soil Number</u>	<u>Soil Series and Slope Phases^{1/}</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
286	Carmi sandy loam		X sand & gravel at 20-40"	
287	Chauncey silt loam			X poorly drained
288	Petrolia silty clay loam			X poorly drained
289	Omaha loam		X somewhat poorly drained	
290	Warsaw silt loam		X sand & gravel at 20-40"	
291	Xenia silt loam	X		
293	Andres silt loam		X somewhat poorly drained	
294	Symerton silt loam	X		
295	Mokena silt loam		X somewhat poorly drained	
296	Washtenaw silt loam			X poorly to very poorly drained
297	Ringwood silt loam	X		
298	Beecher silt loam		X somewhat poorly drained	
299	Nippersink silt loam	X		
301	Grantsburg silt loam			X fragipan at 24" or less
302	Ambraw clay loam			X poorly drained
304	Landes fine sandy loam		X sandy loam subsoil	
305	Palestine loam		X sand & gravel at 20-40"	
306	Allison silty clay loam	X		
307	Iona silt loam	X		

Soil Number	Soil Series and Slope Phases ¹	Suited	Questionable Suitability	Unsuited
308	Alford silt loam 308A, 308B, 308C, 308D---X 308E, 308F-----X slope/ aspect 308G-----X slope			
309	Keytesville silt loam			X clay subsoil - shale or sandstone 20-40"
310	McHenry silt loam	X		
311	Ritchey silt loam			X limestone at 10-20"
312	Rollin muck			X very poorly drained
313	Rodman loam			X sand and gravel at less than 15"
314	Joliet silty clay loam			X poorly drained bedrock less than 20"
315	Channahon silt loam			X limestone at less than 20"
316	Romeo silt loam			X limestone at less than 10"
317	Millsdale silty clay loam			X poorly drained
318	Lorenzo loam or silt loam			X sand & gravel at less than 24"
320	Frankfort silty clay loam		X somewhat poorly drained and silty clay subsoil	
321	DuPage silt loam	X		
322	Russell silt loam 322B, 322C, 322D-----X 322E-----X slope/ aspect			
323	Casco loam			X sand & gravel at less than 20"
325	Dresden silt loam		X sand & gravel at 20-40"	
326	Homer silt loam		X somewhat poorly drained	

<u>Soil Number</u>	<u>Soil Series and Slope Phases</u> ^{1/}	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
327	Fox silt loam		X sand & gravel at 20-40"	
329	Will silty clay loam			X poorly drained
330	Peotone silty clay loam			X very poorly drained
331	Haymond silt loam	X		
332	Billett sandy loam		X sandy loam subsoil	
333	Wakeland silt loam		X somewhat poorly drained	
334	Birds silt loam			X poorly drained
335	Robbs silt loam		X somewhat poorly drained - fragipan at 20-30"	
337	Creal silt loam		X somewhat poorly drained	
338	Hurst silt loam		X somewhat poorly drained	
339	Wellston silt loam 339B, 339C, 339D-----X 339E, 339F -----X		slope/ aspect	
340	Zanesville silt loam		X fragipan at 23-32"	
342	Matherton silt loam		X somewhat poorly drained	
343	Kane silt loam		X somewhat poorly drained	
344	Harvard silt loam	X		
346	Dowagiac silt loam		X sandy loam subsoil	

<u>Soil Number</u>	<u>Soil Series and Slope Phases^{1/}</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
348	Wingate silt loam	X		
353	Toronto silt loam		X somewhat poorly drained	
361	Lapeer loam		X sandy loam at 20-40"	
363	Griswold loam		X sandy loam at 20-40"	
364	Pistakee silt loam		X somewhat poorly drained	
365	Aptakisic silt loam		X somewhat poorly drained	
370	Saylesville silt loam	X		
375	Rutland silt loam		X somewhat poorly drained	
382	Belknap silt loam		X somewhat poorly drained	
386	Downs silt loam 386A, 386B, 386C----- 386D----- X 386E-----X slope/ aspect			
388	Wenona silt loam	X		
390	Hesch loamy sand			X sandy loam over bedrock at 20-40"
394	Longlois silt loam	X		
397	Boone loamy fine sand			X sand subsoil
400	Calco silty clay loam			X poorly drained
402	Colo silty clay loam			X poorly drained
404	Titus silty clay loam			X poorly drained

<u>Soil Number</u>	<u>Soil Series and Slope Phases</u> ^{1/}	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
410	Woodbine silt loam	X		
411	Ashdale silt loam 411B, 411C, 411D-----X 411E -----X slope/ aspect			
412	Ogle silt loam 412B, 412C, 412D-----X 412E-----X slope/ aspect			
413	Gale silt loam		X sandstone at 20-40"	
414	Myrtle silt loam 414B, 414C, 414D-----X 414E -----X slope/ aspect			
415	Orion silt loam		X somewhat poorly drained	
416	Durand silt loam	X		
417	Derinda silt loam		X shale at 20-40"	
418	Schapville silt loam		X shale at 20-40"	
419	Flagg silt loam 419B, 419C, 419D-----X 419E -----X slope/ aspect			
420	Piopolis silty clay loam			X poorly to very poorly drained
422	Cape silty clay loam			X poorly drained
425	Muskingum stony silt loam 425E, 425F-----X bedrock 20-40" 425G -----X slope & depth			
426	Karnak silty clay			X poorly drained

<u>Soil Number</u>	<u>Soil Series and Slope Phases</u> ^{1/}	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
427	Burnside silt loam		X 35 to 80% coarse fragments	
428	Coffeen silt loam		X somewhat poorly drained	
429	Palsgrove silt loam 429B, 429C, 429D-----X 429E, 429F-----X		X slope/ aspect	
435	Streator silty clay loam			X poorly drained
442	Mundelein silt loam		X somewhat poorly drained	
443	Barrington silt loam	X		
448	Mona silt loam		X silty clay commonly less than 40"	
451	Lawson silt loam		X somewhat poorly drained	
452	Riley silty clay loam			X sand at 18-24" - some- what poorly drained
453	Muren silt loam	X		
454	Iva silt loam		X somewhat poorly drained	
456	Ware silt loam		X sand at 15-30"	
460	Ginat silt loam			X poorly drained
461	Weinbach silt loam		X somewhat poorly drained- fragipan at 15-30"	
462	Sciotoville silt loam		X fragipan at 20-30"	

<u>Soil Number</u>	<u>Soil Series and Slope Phases</u> ^{1/}	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
463	Wheeling silt loam	X		
464	Wallkill silty clay loam			X very poorly drained
465	Montgomery silty clay			X poorly to very poorly drained
467	Markland silt loam		X silty clay subsoil	
469	Emma silty clay loam	X		
470	Keller silt loam		X somewhat poorly drained	
471	Clarksville cherty silt loam (formerly Bodine)			X more than 60% coarse fragments
474	Piasa silt loam			X poorly drained; high sodium
475	Elsah cherty silt loam		X 25-60% chert fragments	
481	Raub silt loam		X somewhat poorly drained	
482	Uniontown silt loam	X		
484	Harco silt loam		X somewhat poorly drained	
490	Odell silt loam		X somewhat poorly drained	
495	Corwin silt loam	X		
496	Fincastle silt loam		X somewhat poorly drained	
497	Mellott silt loam	X		
504	Sogn silt loam			X limestone at less than 20"
505	Dunbarton silt loam 505B, 505C, 505D, 505E-----			X bedrock at 12-20"
506	Hitt silt loam	X		

Soil Number	Soil Series and Slope Phases ^{1/}	Suited	Questionable Suitability	Unsuited
513	Granby loamy fine sand			X poorly drained soil
531	Markham silt loam		X silty clay subsoil	
546	Keltner silt loam 546B, 546C, 546D-----X 546E, 546F -----X slope/ 546G -----X slope & depth aspect			
547	Eleroy silt loam 547B, 547C, 547D-----X 547E, 547F-----X slope/ aspect			
549	Marseilles silt loam		X shale at 20-40"	
554	Kernan silt loam		X somewhat poorly drained	
560	St. Clair silt loam 560C, 560D, 560E, 560F, 560G-----X clay subsoil			
564	Waukegan silt loam		X sand and gravel at 20-40"	
565	Tell silt loam		X sand at 20-30"	
567	Elkhart silt loam 567C, 567D-----X 567E-----X slope/ aspect			
572	Loran silt loam		X somewhat poorly drained	
576	Zwingle silt loam			X poorly drained
581	Tamalco silt loam			X high sodium subsoil
583	Pike silt loam	X		
584	Walshville loam			X high sodium subsoil

<u>Soil Number</u>	<u>Soil Series and Slope Phases</u> ^{1/}	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
585	Negley loam 585B, 585C, 585D-----X 585E, 585F -----X slope/ 585G-----X slope aspect			
586	Nokomis silt loam		X somewhat poorly drained	
587	Terril loam	X		
589	Bowdre silty clay		X somewhat poorly drained	
590	Cairo silty clay			X poorly drained
594	Reddick silty clay loam			X poorly drained
597	Armiesburg silty clay loam	X		
598	Bedford silt loam 598D, 598E, 598F-----X fragipan at 20-30"			
599	Baxter cherty silt loam 599E, 599F, 599G-----X clay or silty clay subsoil with 20-40% chert			
600	Huntington silt loam	X		
609	Crane silt loam		X somewhat poorly drained	
617	Otterbein silt loam		X somewhat poorly drained	
628	Lax silt loam 628E, 628F -----X fragipan at 20-30"			
633	Traer silt loam			X poorly to very poorly drained
656	Octagon silt loam	X		
660	Coatsburg silt loam			clay subsoil & X poorly drained

<u>Soil Number</u>	<u>Soil Series and Slope Phases^{1/}</u>	<u>Suited</u>	<u>Questionable Suitability</u>	<u>Unsuited</u>
683	Lawndale silt loam		X somewhat poorly drained	
684	Broadwell silt loam	X		
685	Middletown silt loam	X		
696	Zurich silt loam	X		
697	Wauconda silt loam		X somewhat poorly drained	
698	Grays silt loam	X		
706	Boyer sandy loam 706A, 706B, 706C, 706D, 706E, 706F-----		X sandy loam subsoil	
723	Reesville silt loam		X somewhat poorly drained	
728	Winnebago silt loam 728C, 728D-----X 728E, 728F-----		X slope/aspect	
731	Nasset silt loam	X		
743	Ridott silt loam			X poorly to somewhat poorly drained
745	Shullsburg silt loam		X shale at 20-40"	
746	Calamine silt loam			poorly to very X poorly drained
752	Oneco silt loam	X		
753	Massbach silt loam	X		
956	Brandon & Saffell soils 956B, 956C----- 956F-----		X gravel at about 24"	
				X gravel at less than 20"

Refer to the individual soil series named in the following mapping units

- 953 Hosmer-Lax complex
- 954 Alford-Baxter complex
- 955 Muskingum and Berks¹/undifferentiated group
- 956 Brandon and Saffell undifferentiated group (in Pope & Massac Counties
only)
- 958 Hickory and Hennepin undifferentiated group
- 962 Sylvan-Bold complex
- 963 Hickory 1 & Sylvan sil undifferentiated group
- 964 Hennepin 1 & Miami sil undifferentiated group
- 965 Tallula-Bold complex
- 966 Miami-Russell complex
- 968 Birkbeck-Miami complex
- 969 Rodman-Casco complex
- 970 Keller-Coatsburg complex
- 971 Fishhook-Atlas complex
- 972 Casco-Fox complex
- 973 Dubuque & Dunbarton undifferentiated group
- 974 Dickinson-Onarga complex
- 975 Alvin-Lamont complex
- 978 Wauconda & Beecher undifferentiated group
- 979 Grays & Markham undifferentiated group
- 980 Zurich & Morley undifferentiated group
- 981 Wauconda & Frankfort undifferentiated group
- 982 Aptakisic & Nappanee undifferentiated group
- 983 Zurich & Nappanee undifferentiated group
- 984 Barrington & Varna undifferentiated group

- 985 Alford-Bold complex
- 986 Wellston-Berks^{1/} complex
- 989 Mundelein & Elliott undifferentiated group
- 990 Stookey-Bodine complex
- 991 Cisne-Huey complex
- 992 Hoyleton-Tamalco complex
- 993 Cowden-Piasa complex
- 994 Oconee-Tamalco complex
- 995 Herrick-Piasa complex
- 996 Velma-Walshville complex
- 997 Hickory-Hennepin complex
- 998 Hickory-Negley complex
- 999 Hickory-Alford complex

1/ Berks not mapped separately to date. Similar to Muskingum but subsoil contains more coarse fragments.

TABLE 3.--ALPHABETICAL LIST OF ILLINOIS SOILS WITH SOIL NUMBERS IN PARENTHESIS --OCTOBER 1971

Ade loamy fine sand (98)	Berks in undifferentiated group with Muskingum (955) and complex with Wellston (986)
Alford silt loam (308)	
Allison silty clay loam (306)	Biggs sandy loam (202)
Alvin fine sandy loam (131)	Biggsville silt loam (276)
Ambraw clay loam (302)	Billett sandy loam (332)
Andres silt loam (293)	Birds silt loam (334)
Aptakisic silt loam (365)	Birkbeck silt loam (233)
Arenzville silt loam (78)	Blair silt loam (5)
Argyle silt loam (227)	Bloomfield fine sand (53)
Armiesburg silty clay loam (597)	Blount silt loam (23)
Ashdale silt loam (411)	Bluford silt loam (13)
Ashkum silty clay loam (232)	Bold silt loam (35)
Assumption silt loam (259)	Bolivia silt loam (246)
Atlas silt loam (7)	Bonnie silt loam (108)
Atterberry silt loam (61)	Boone loamy fine sand (397)
Ava silt loam (14)	Bowdre silty clay (589)
Ayr sandy loam (204)	Boyer sandy loam (706)
Barrington silt loam (443)	Brandon and Saffell (956)
Batavia silt loam (105)	Brenton silt loam (149)
Baxter cherty silt loam (599)	Broadwell silt loam (684)
Beardstown loam (188)	Brooklyn silt loam (136)
Beasley silt loam (691)	Bryce silty clay (235)
Beaucoup silty clay loam (70)	Burnside silt loam (427)
Bedford silt loam (598)	Cairo silty clay (590)
Beecher silt loam (298)	Calamine silt loam (746)
Belknap silt loam (382)	Calco silty clay loam (400)

Camden silt loam (134)	Denny silt loam (45)
Cape silty clay loam (422)	Denrock silt loam (262)
Carmi sandy loam (286)	Derinda silt loam (417)
Casco loam (323)	Dickinson sandy loam (87)
Catlin silt loam (171)	Disco sandy loam (266)
Channahon silt loam (315)	Dodge silt loam (24)
Chatsworth silt loam (241)	Dodgeville silt loam (40)
Chauncey silt loam (287)	Dorchester silt loam (239)
Chute fine sand (282)	Douglas silt loam (128)
Cisne silt loam (2)	Dowagiac silt loam (346)
Clarence silty clay loam (147)	Downs silt loam (386)
Clarksdale silt loam (257)	Dresden silt loam (325)
Clarksville cherty silt loam (471) (formerly Bodine)	Drummer silty clay loam (152)
Clary silt loam (283)	Drury silt loam (75)
Clinton silt loam (18)	Dubuque silt loam (29)
Coatsburg silt loam (660)	Dunbarton silt loam (505)
Coffeen silt loam (428)	DuPage silt loam (321)
Colo silty clay loam (402)	Dupo silt loam (180)
Colp silt loam (122)	Durand silt loam (416)
Corwin silt loam (495)	Ebbert silt loam (48)
Cowden silt loam (112)	Edgington silt loam (272)
Crane silt loam (609)	Edinburg silty clay loam (249)
Creal silt loam (337)	Elburn silt loam (198)
Dana silt loam (56)	Elco silt loam (119)
Darwin silty clay (71)	Eleroy silt loam (547)
Decorra silt loam (273)	Elkhart silt loam (567)
Del Rey silt loam (192)	Elliott silt loam (146)

Ellison silt loam (137)	Herbert silt loam (62)
Elsah cherty silt loam (475)	Herrick silt loam (46)
Emma silty clay loam (469)	Hesch loamy sand (390)
Fall silt loam (263)	Hickory loam (8)
Fayette silt loam (280)	Hitt silt loam (506)
Fincastle silt loam (496)	Homer silt loam (326)
Fishhook silt loam (6)	Hoopeston sandy loam (172)
Flagg silt loam (419)	Hopper silt loam (281)
Flanagan silt loam (154)	Hosmer silt loam (214)
Fox silt loam (327)	Houghton muck (103)
Frankfort silty clay loam (320)	Houghton peat (97)
Gale silt loam (413)	Hoyleton silt loam (3)
Gilford fine sandy loam (201)	Huey silt loam (120)
Ginat silt loam (460)	Huntington silt loam (600)
Gorham silty clay loam (162)	Huntsville silt loam (77)
Granby loamy fine sand (513)	Hurst silt loam (338)
Grantsburg silt loam (301)	Iona silt loam (307)
Grays silt loam (698)	Ipava silt loam (43)
Griswold loam (363)	Iva silt loam (454)
Hamburg silt (30)	Jacob clay (85)
Harco silt loam (484)	Joliet silty clay loam (314)
Harpster silty clay loam (67)	Joy silt loam (275)
Harrison silt loam (127)	Jules silt loam (28)
Hartsburg silty clay loam (244)	Kane silt loam (343)
Harvard silt loam (344)	Karnak silty clay (426)
Harvel silty clay loam (252)	Keller silt loam (470)
Haymond silt loam (331)	Keltner silt loam (546)
Hennepin loam (25)	Kendall silt loam (242)

Keomah silt loam (17)
Kernan silt loam (554)
Keytesville silt loam (309)
Kilbourne loamy sand (203)
Knight silt loam (191)
LaHogue loam (102)
Lamont fine sandy loam (175)
Landes fine sandy loam (304)
Lapeer loam (361)
LaRose silt loam (60)
Lawndale silt loam (683)
Lawson silt loam (451)
Lax silt loam (628)
Lena muck (210)
Levan loamy fine sand (31)
Lisbon silt loam (59)
Littleton silt loam (81)
Lomax loam (265)
Longlois silt loam (394)
Loran silt loam (572)
Lorenzo loam or silt loam (318)
Lukin silt loam (167)
Marissa silt loam (176)
Markham silt loam (531)
Markland silt loam (467)
Marseilles silt loam (549)
Martinton silt loam (189)
Massbach silt loam (753)

Matherton silt loam (342)
Maumee fine sandy loam (89)
McFain silty clay (248)
McGary silt loam (173)
McHenry silt loam (310)
Mellott silt loam (497)
Metea loamy sand (205)
Miami silt loam (27)
Middletown silt loam (685)
Milford silty clay loam (69)
Millbrook silt loam (219)
Millington loam (82)
Millsdale silty clay loam (317)
Milroy sandy loam (187)
Mokena silt loam (295)
Mona silt loam (448)
Monee silt loam (229)
Montgomery silty clay (465)
Montmorenci silt loam (57)
Morley silt loam (194)
Mt. Carroll silt loam (268)
Mundelein silt loam (442)
Muren silt loam (453)
Muscatine silt loam (41)
Muskingum stony silt loam (425)
Myrtle silt loam (414)
Nappanee silt loam (228)
Nasset silt loam (731)

Negley loam (585)	Patton silty clay loam (142)
Newart silt loam (161)	Pecatonica silt loam (21)
Newberry silt loam (218)	Pella silty clay loam (153)
Niota silt loam (261)	Peotone silty clay loam (330)
Nippersink silt loam (299)	Petrolia silty clay loam (288)
Nokomis silt loam (586)	Piasa silt loam (474)
Oakford silt loam (39)	Pike silt loam (583)
Oconee silt loam (113)	Pillot silt loam (159)
Octagon silt loam (656)	Piopolis silty clay loam (420)
Odell silt loam (490)	Pistakee silt loam (364)
O'Fallon silt loam (114)	Pittwood fine sandy loam (130)
Ogle silt loam (412)	Plainfield sand (54)
Okaw silt loam (84)	Plano silt loam (199)
Omaha loam (289)	Plattville silt loam (240)
Onarga fine sandy loam (190)	Port Byron silt loam (277)
Onarga sandy loam (150)	Proctor silt loam (148)
Oneco silt loam (752)	Racoon silt loam (109)
Orio sandy loam (200)	Radford silt loam (74)
Orion silt loam (415)	Rankin sandy loam (157)
Otter silt loam (76)	Rantoul silty clay (238)
Otterbein silt loam (617)	Raub silt loam (481)
Palestine loam (305)	Reddick silty clay loam (594)
Palms muck (100)	Reesville silt loam (723)
Palsgrove silt loam (429)	Richview silt loam (4)
Pana silt loam (256)	Ridgeville fine sandy loam (151)
Papineau fine sandy loam (42)	Ridott silt loam (743)
Parke silt loam (15)	Riley silty clay loam (452)
Parr silt loam (221)	Ringwood silt loam (297)

Ritchey silt loam (311)	Shiloh silty clay loam (138)
Robbs silt loam (335)	Shullsburg Silt loam (745)
Roby fine sandy loam (184)	Sicily silt loam (258)
Rodman loam (313)	Sidell silt loam (55)
Rodman gravelly loam (93)	Sogn silt loam (504)
Rollin muck (312)	Sparta loamy sand (88)
Romeo silt loam (316)	Starks silt loam (132)
Ross loam (73)	Stockland loam (155)
Rowe silty clay (230)	Stonington loam (253)
Rozetta silt loam (279)	Stookey silt loam (216)
Ruark fine sandy loam (178)	Stoy silt loam (164)
Rushville silt loam (16)	Strawn silt loam (224)
Russell silt loam (322)	Streator silty clay loam (435)
Rutland silt loam (375)	Stronghurst silt loam (278)
Sabina silt loam (236)	Sunbury silt loam (234)
Sable silty clay loam (68)	Swygert silty clay loam (91)
Saffell (in group with Brandon) (956)	Sylvan silt loam (19)
St. Charles silt loam (243)	Symerton silt loam (294)
St. Clair silt loam (560)	Tallula silt loam (34)
Sarpy sand (92)	Tama silt loam (36)
Sawmill silty clay loam (107)	Tamalco silt loam (581)
Saybrook silt loam (145)	Tamms silt loam (211)
Saylesville silt loam (370)	Tell silt loam (565)
Schapville silt loam (418)	Terril loam (587)
Sciotoville silt loam (462)	Thebes silt loam (212)
Seaton silt loam (274)	Thorp silt loam (206)
Selma loam (125)	Tice silty clay loam (284)
Sexton silt loam (208)	Timula silt loam (271)
Sharon silt loam (72)	Titus silty clay loam (404)

Toronto silt loam (353)	Whitson silt loam (116)
Traer silt loam (633)	Will silty clay loam (329)
Troxel silt loam (197)	Wingate silt loam (348)
Uniontown silt loam (482)	Winnebago silt loam (728)
Varna silt loam (223)	Woodbine silt loam (410)
Velma loam (250)	Worthen silt loam (37)
Virden silty clay loam (50)	Wynoose silt loam (12)
Virgil silt loam (104)	Xenia silt loam (291)
Volinia silt loam (79)	Zanesville silt loam (340)
Wabash silty clay (83)	Zurich silt loam (696)
Wagner silt loam (26)	Zwingle silt loam (576)
Wakeland silt loam (333)	
Wallkill silty clay loam (464)	
Walshville loam (584)	
Ware silt loam (456)	
Warsaw silt loam (290)	
Wartrace silt loam (215)	
Washtenaw silt loam (296)	
Watseka loamy fine sand (49)	
Wauconda silt loam (697)	
Waukegan silt loam (564)	
Weinbach silt loam (461)	
Weir silt loam (165)	
Wellston silt loam (339)	
Wenona silt loam (388)	
Wesley sandy loam (141)	
Westville silt loam (22)	
Wheeling silt loam (463)	

